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STATE OF SOUTH CAROLINA)
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(Caption of Case)

South Carolina Electric & Gas Company's Integrated Resource Plan (IRP))
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BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

COVER SHEET

DOCKET NUMBER: 2012 - 9 - E

(Please type or print)

Submitted by: Tom Clements **SC Bar Number:**

Telephone: 803-834-3084

Address: 1112 Florence Street **Fax:**

Colunbia, SC 29201 **Other:**

Email: tomclements329@cs.com

NOTE: The cover sheet and information contained herein neither replaces nor supplements the filing and service of pleadings or other papers as required by law. This form is required for use by the Public Service Commission of South Carolina for the purpose of docketing and must be filled out completely.

DOCKETING INFORMATION (Check all that apply)

☐ **Emergency Relief demanded in petition**

☐ **Request for item to be placed on Commission's Agenda expeditiously**

☐ **Other:**

INDUSTRY (Check one)

- ☒ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☐ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

NATURE OF ACTION (Check all that apply)

- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☐ Brief
- ☐ Certificate
- ☒ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☐ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ *Late-Filed Exhibit*
- ☐ Letter
- ☐ Memorandum
- ☐ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☐ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☐ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☐ Report
- ☒ Request
- ☐ Request for Certification
- ☐ Request for Investigation
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☐ Other:

Print Form Reset Form

Alliance for Nuclear Accountability

A national network of organizations working to address issues of nuclear weapons production and waste cleanup

June 21, 2012

The Honorable Jocelyn G. Boyd
Chief Clerk/Administrator
Public Service Commission of South Carolina
101 Executive Center Drive
Columbia, South Carolina 29210

Dear Ms. Boyd:

I am hereby submitting this letter and attachments concerning Docket Number 2012-9-E [South Carolina Electric & Gas Company's Integrated Resource Plan (IRP)]. I am making this submission on behalf of the Alliance for Nuclear Accountability (ANA) and myself, an SCE&G rate payer.

I am submitting this letter and attachments to be officially recorded in the docket. The matter addressed with this filing concerns a failure of the IRP to address SCE&G's plans for so-called "small modular reactors," which the company has recently began presenting as a replacement power source for coal-burning facilities.

Awaiting what may develop with SCE&G's IRP filing, I reserve the right to intervene in the docket if SCE&G's IRP is not resubmitted or amended so as to discuss the matter raised in this filing.

Likewise, I reserve the right to file a formal objection and also to request an investigation if the IRP is not properly amended and refilled and if the matter raised by this filing is not fully and properly discussed in an amended IRP.

The South Carolina Public Service Commission, the Office of Regulatory Staff and the public at large have the right to be informed on SCE&G's long-range energy plans through the IRP process. I thus request that PSC staff address the failure of SCE&G to file any mention of its plans concerning "small modular reactors" in its recently filed IRP by requesting that SCE&G be directed to file a revised and accurate IRP forthwith.

Sincerely,

Tom Clements

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Failure of IRP Filing in Docket Number 2012-9-E [South Carolina Electric & Gas Company's Integrated Resource Plan (IRP)] to Address Plans for Small Modular Reactors (SMRs)

Public Service Commission of South Carolina Must be Fully Informed of SMR Plans

June 21, 2012

The Integrated Resource Plan (IRP) of South Carolina Electric and Gas, filed with the South Public Service Commission of South Carolina on May 30, 2012 has critical deficiencies related to SCE&G's interest in so-called "small modular reactors." This oversight must be corrected immediately.

The IRP as filed clearly states the following key point in the introduction:

This document presents South Carolina Electric & Gas Company's ("SCE&G" or "Company") Integrated Resource Plan ("IRP") for meeting the energy needs of its customers over the next fifteen years, 2012 through 2026.

Yet, despite this affirmation in the IRP, the omissions in the document reveal that SCE&G's planning for energy resources though the year 2026 do not comport with what is being said by Stephen A. Byrne, President of South Carolina Electric & Gas Company (SCE&G) Generation & Transmission and Chief Operating Officer of SCE&G, concerning use of "small modular reactors" (SMRs) as a way to replace coal generating stations.

The IRP is in need of being revised and resubmitted to reflect the involvement of SCE&G in plans for deployment of "small modular reactors" at current sites of coal-fired power plants or any other sites as well as the company's involvement with construction and operation of small modular reactors at the U.S. Department of Energy's Savannah River Site located near Aiken, South Carolina.

SMRs only exist on paper, have not been shown to be financially viable and may well rely on large federal subsidies to be developed and constructed. That SCE&G is already involved in efforts to deploy them could have major financial implications for the company, rate payers and tax payers and the PSC and public must be made aware in the IRP of what those plans are through 2026.

In the "Scenario Planning and Risk" section of the IRP, it is stated that "There is considerable uncertainty associated with planning for the future. Two principle sources of uncertainty are the economy and the state of federal environmental regulations." (page 30) It appears that an additional source of uncertainty is failure to reveal any aspect of SCE&G's involvement in small modular reactors, including dates of deployment of first reactor, number of modules planned and dates of deployment, capacity of the modules, plans for delivery of electricity to SRS or the grid.

Additionally, it is unclear if SCE&G would add the SMRs to the rate base or plans to put in place some other arrangement for sale of electricity. Given the licensing, technical and economic uncertainties associated with SMRs, there exists no evidence at this time that SMRs can successfully be developed and deployed but as the IRP is forward looking and includes plans through 2026, some in the company may well be assuming that deployment will take place, necessitating full disclosure in the IRP.

Thus, a revised IRP must completely and in detail present plans for SMRs that are now being presented in public. Or, the IRP must definitively state that any such plans being presented are premature and inaccurate and based on mere speculation.

DOE Announces Funding Subsidy for Small Modular Reactors

On March 22, 2012, the U.S. Department issued a news release entitled "Obama Administration Announces $450 Million to Design and Commercialize U.S. Small Modular Nuclear Reactors." (http://www.ne.doe.gov/newsroom/2012PRs/nePR032212.html)

In the news release, DOE announced:

> Through cost-share agreements with private industry, the Department will solicit proposals for promising SMR projects that have the potential to be licensed by the Nuclear Regulatory Commission and achieve commercial operation by 2022. These cost-share agreements will span a five-year period and, subject to congressional appropriations, will provide a total investment of approximately $900 million, with at least 50 percent provided by private industry.

Thus, it is clear that it is the intention to fund SMR projects that can actually be built by 2022, four years earlier than the period covered by the current SCE&G IRP.

Models of SMRs to possibly be located at the DOE's Savannah River Site are vying for the federal subsidy, including the Holtec model. A June 19, 2012 news conference by Governor Haley at the state house was a public relations attempt to garner attention to the Holtec design in order to win a $450 million subsidy from the federal government. (Two SMR designs will be chosen by for the subsidy by September 2012).

SCE&G's Byrne, who participated in the June 12 public relations event with Governor Haley, is well aware that the DOE's date to "achieve commercial operation" for an SMR is 2022 and that this date is within the period covered by the SCE&G IRP.

Savannah River Site (SRS) Advocates for SMR with SCANA Participation

On June 5, 2012, an SRS official, Helen Belencan, made a presentation entitled "Small Modular Reactor Update" to the SRS Citizen Advisory Board's Strategic & Legacy Management Committee, which met in Aiken, SC.

The Belencan presentation is located on the SRS CAB website at:
http://www.srs.gov/general/outreach/srs-cab/library/meetings/2012/slm/20120605_smr.pdf

Ms. Belencan affirmed at the CAB meeting, which I attended, that "SCANA is looking at SMRs to offset old coal plants" and stated that a vendor would build an SMR at SRS and that it would be "operated by SCE&G."

Issues related to this reactor supplying electricity to users in the SCE&G and Georgia Power service areas and questions concerning a mentioned proposal to provide electricity to a dedicated set of industrial users located off the Savannah River Site was not clarified.

An unrealistic plan or not, it is clear that SRS is now striving to locate an SMR at the site, with the goal to comply with the 2022 date established by the DOE's office of Nuclear Energy.

So, is SCANA or SCE&G involved in this SMR effort at SRS or not? DOE statements contrast with what is absent in the IRP.

Holtec Thanks SCE&G for Involvement in SMURF Reactor Project

In a May 30, 2012 statement entitled "Holtec Applies for DOE's Grant Funds to Support the Development of SMR-160" by Holtec International - http://www.holtecinternational.com/holtec/wp-content/uploads/2012/05/HH27_05.pdf - the company thanked SCE&G for supporting its development of Holtec's SMR-160 small modular reactor:

> We are also fortunate to have endorsements of SMR-160 by America's largest and most respected nuclear operators, notably Exelon, Entergy, PSEG, First Energy, and SCE&G, who after scrutinizing our reactor's design, have provided written commentaries (included in our response to the DOE) on the caliber of the SMR-160 technology.
>
> We thank the DOE for agreeing to offer the Savannah River Site (SRS) as the site for building the first SMR-160 and to SCE&G for agreeing to operate the plant.

This formal statement by Holtec is clear in thanking SCE&G for providing comments that were submitted to DOE on its reactor design and for thanking "SCE&G for agreeing to operate the plant." Discussion of this agreement or whatever arrangement is planned is lacking in the IRP.

A Holtec statement of March 5, 2012 entitled "DOE, Its South Carolina Entities, and Holtec Sign the Protocol to Build the Company's Small Modular Reactor at the Savannah River Site" - http://www.holtecinternational.com/sites/default/files/pr/HH27_01.pdf -

> We are pleased to announce that a Memorandum of Agreement (MOA) between our wholly owned subsidiary SMR, LLC and the U.S. Department of Energy Savannah River Office (DOE-SR), along with the Savannah River National Laboratory (SRNL), has been

> executed to situate our first 160 MW(e) small modular reactor at the Savannah River Site (SRS). The MOA establishes a framework in which Holtec, SRNL, and DOE-SR will leverage the unique assets and resources of the sprawling 310-square mile SRS near Aiken, South Carolina for expedited development, licensing, construction, commissioning, and operation of our flagship reactor, named SMR-160.

It can thus be seen that it is the intention of Holtec and its partners to construction and operate the SMR-160 reactor at SRS.

Additionally, the company states in the March 5 statement that the "SMR-160 is a 160 MW(e) nuclear reactor based on Holtec's HI-SMUR (which stands for *H*oltec *I*nherently *S*afe *M*odular *U*nderground *R*eactor) technology," frequently referred to by the public as the Safe Modular Underground Reactor facility or SMURF reactor.

IRP Lacking Any Mention of Small Modular Reactors in Pertinent Sections

In the IRP section entitled "New Nuclear Capacity" (pages 26-27) there is no discussion at all of any form of plans for SMR or any indication that the company may be involved in any way with SMRs through the year 2026.

In a box in the IRP labeled "Range of Options Considered" (page 28), concerning the shut down or conversion of existing coal plants, there is no mention of even the possibility of SMRs being deployed to replace coal plants or to be placed on the sites of any coal facilities.

Byrne Speaks Up on SMRs Replacing Coal

At a news conference held by Governor Nikki Haley on June 19 along with backers of a specific SMR design (by Holtec), Mr. Steve Byrne spoke before a small gathering, including myself, and advocated for SMRs as a replacement for coal. Amongst others, representatives of Savannah River Nuclear Solutions, which manages the Savannah River Site, and the French government owned company AREVA were also in attendance.

According to a June 19 article in the Charleston Regional Business Journal entitled "Haley, SCE&G support SMR industry," Mr. Byrne is quoted as advocating SMRs as a replacement for coal-fired power plants.

See article at:
http://www.charlestonbusiness.com/news/44251-haley-sce-amp-g-support-smr-industry?rss=0

But, in a SCANA news release of May 30, 2012, entitled "SCE&G Announces Plans to Retire a Portion of its Coal-fired Generation," no mention of replacing coal units with SMR was made. The news release states: "Since announcing our new nuclear project in 2008, we've said that the addition of the two new nuclear units would give us flexibility to look at reducing our

reliance on coal and allow us to achieve better fuel diversity in our electric generation portfolio," said Kevin Marsh, Chairman and CEO of SCE&G's parent company, SCANA Corp.

As it appears that Mr. Byrne's statements contrast with both the IRP and those of CEO Marsh, clarity on this matter is needed. If it is the AP1000s that give the company "flexibility" then what about any SMRs?

SMURF Reactor Operated by SCE&G to Produce Nuclear Bomb Material, Use Plutonium Fuel (MOX)?

The Memorandum of Agreement (MOA) signed between Holtec and Savannah River National Laboratory in December 2011 - http://www.ananuclear.org/Portals/0/SMR,%20LLC%20MOA.pdf – reveals an interest in production of tritium gas, used to boost the explosive power of all nuclear weapons and the possible use of plutonium fuel (MOX), possibly derived from surplus weapons plutonium or reprocessing of highly radioactive commercial spent fuel:

> In addition, the Parties agree to invite the NNSA to discuss the feasibility of additional Agreements to irradiate Tritium Producing Burnable Absorption Rods (TPBARs) and Mixed Oxide Fuel (MOX).

As Holtec has indicated SCE&G has "agreed" to operate the reactor, this means that SCE&G would be involved in production of nuclear weapons materials if this aspect of the MOA is pursued and put in place. Operation of a reactor by SCE&G which serves military purposes would be a disturbing departure from SCE&G's mission to provide electricity from commercial facilities and would cross the imaginary line between the military and civilian fuel cycles.

It is unclear where plutonium for fabrication into MOX fuel would be derived. Interest in MOX use could imply that Holtec and SRNL either believe that the DOE's problem-plagued program to use MOX fuel in existing commercial light-water reactors is at risk of collapsing or that plutonium could be derived via reprocessing of spent commercial fuel. There are indications that special interests are considering making a bid to provide storage capacity in South Carolina, likely at SRS, for the nation's spent nuclear fuel – an effort that will be highly controversial and likely to draw wide-spread opposition throughout South Carolina.

Along with spent fuel storage could come reprocessing, a chemical process which separates plutonium from spent fuel while leaving behind a host of hard-to-manage radioactive waste streams. This, too, will likely garner wide-spread public opposition. In fact, a coalition of conservation groups in South Carolina went on record in October 2011, before the DOE's Blue Ribbon Commission on what to do with radioactive spent fuel, against "consolidated" spent fuel storage and reprocessing at the Savannah River Site.

SCE&G must fully explain in the IRP any plans to become involved in nuclear weapons activities and use of plutonium fuel through 2026. Anticipated reimbursement from DOE for engaging in

these controversial programs and impact on power production and costs for electricity generation must be discussed in the IRP.

What Does Pursuit of SMRs Imply Related to the AP1000 Project?

SCE&G's involvement in the SMURF project and perhaps other SMR designs being pursued by SRS – NuScale and Hyperion (Ge4 Energy) – raises questions about intentions related to the AP1000 project now being undertaken at SCE&G's V.C. Summer site.

A host of questions come to mind:

- Does SCE&G think that power generated by the SMRs will displace power from the AP1000s?
- If SMR's come on line in which SCE&G is involved, does SCE&G plan to export power generated by the AP1000s out of state?
- Would the SMRs provide base-load power?
- What is the anticipated cost of SMR construction – total cost and cost per kwh – and how does this compare with the AP1000 cost?
- What is the anticipated cost of electricity from the SMRs vs the AP1000s?
- Will rate payers or SRS be forced to subsidize SMR construction and operation via "Power Purchase Agreements," as mentioned in the MOA of December 2011?
- Is out-of-state sale of electricity from the SMR anticipated, such as to Fort Gordon in Georgia and has any discussion of this taken place with Georgia Power?
- As there is no discussion of SMRs in the IRP of May 30, 2012, have the Public Service Commission of South Carolina and the Office of Regulatory Staff been otherwise fully apprised of SCE&G's involvement in SMRs and the impact of this project on AP1000 power generation and retirement of coal-fired generating facilities?

In conclusion, it is incumbent upon SCE&G to now revise its IRP to full reveal its involvement in plans through 2026 for deployment and operation of any small modular reactors. Lacking voluntary and prompt modification by SCE&G, the Public Service Commission of South Carolina must direct SCE&G to revise the IRP so as to fully, openly and honestly reveal any plans related to small modular reactors. If no revision to the IRP is made by SCE&G then the public can possibly conclude that statements about involvement with SMRs have been misleading and inaccurate.

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Attachments

Alliance for Nuclear Accountability (ANA) news release, June 8, 2012, "Documents Reveal Timeline and Plans for "Small Modular Reactors" (SMRs) at the Savannah River Site (SRS) Unrealistic and Promise no Funding,"
http://www.ananuclear.org/Issues/GlobalNuclearEnergyPartnership/Library/tabid/56/articleType/ArticleView/articleId/558/Default.aspx

Memorandum of Agreement - obtained via Freedom of Information Act request by ANA- between Holtec and the Savannah River National Lab, December 2011,
http://www.ananuclear.org/Portals/0/SMR,%20LLC%20MOA.pdf

Charleston Regional Business Journal article, June 19, 2012, "Haley, SCE&G support SMR industry," http://www.charlestonbusiness.com/news/44251-haley-sce-amp-g-support-smr-industry?rss=0

"Small Modular Reactor Update" presentation, June 5, 2012, Helen Belencan of the DOE's Savannah River Site, to the SRS Citizen Advisory Board's Strategic & Legacy Management Committee, http://www.srs.gov/general/outreach/srs-cab/library/meetings/2012/slm/20120605_smr.pdf

DOE news release, March 22, 2012, "Obama Administration Announces $450 Million to Design and Commercialize U.S. Small Modular Nuclear Reactors,"
http://www.ne.doe.gov/newsroom/2012PRs/nePR032212.html

Conservation groups' statement to the Blue Ribbon Commission, October 18, 2011, against consolidated spent fuel storage and reprocessing at the Savannah River Site

Alliance for Nuclear Accountability

A national network of organizations working to address issues of nuclear weapons production and waste cleanup

For immediate Release: June 19, 2012

Contact: Tom Clements, Nonproliferation Policy Director – tomclements329@cs.com, 803-240-7268

Documents Reveal Time-line and Plans for "Small Modular Reactors" (SMRs) at the Savannah River Site (SRS) Unrealistic and Promise no Funding

One SMR Design being Eyed at SRS for Use of Plutonium Fuel (MOX) and Production of Tritium Gas Used in Nuclear Weapons

Columbia, SC --- Documents obtained under the Freedom of Information Act (FOIA) by the Alliance for Nuclear Accountability (ANA) reveal unrealistic plans for pursuit of "small modular reactors" (SMR) at the Department of Energy's Savannah River Site, located near Aiken, South Carolina. The obtained Memoranda of Agreement (MOA) between SMR vendors and the Savannah River Site address three conceptual designs: NuScale, SMR, LLC and Gen4 Energy (formerly Hyperion).

"It's clear that officials at SRS are caught up in an unrealistic public relations campaign to promote imaginary SMRs at the site," said Tom Clements, Nonproliferation Policy Director with the Alliance for Nuclear Accountability. "SRS is unfortunately staking its future on development of SMRs when there is little indication that they will be economically or technologically practical. The future of SMRs at SRS is doubtful at best and no amount of public relations spin will make them come true absent sound designs and large amounts of private funding."

The MOAs indicate that sale of electricity to SRS via "Purchase Power Agreements" (PPAs) is being viewed as a way to fund the reactors. "Sales of electricity produced by SMRs at high rates to SRS is nothing but a back-door subsidy by big government and will not be defensible to the public or Congress," said Clements. "It's time for big government to stop choosing winners and losers among SMR concepts and let the free market decide if SMRs will be pursued."

The MOA with SMR, LLC for the "Safe Modular Underground Reactor" indicates pursuit of controversial nuclear weapons-related programs. The MOA states that "the Parties agree to invite the NNSA [National Nuclear Security Administration] to discuss the feasibility of additional Agreements to irradiate Tritium Producing Burnable Absorption Rods (TPBARs) and Mixed Oxide Fuel (MOX)." These plans refer to the production of radioactive tritium gas used to boost the explosive power of all U.S. nuclear weapons and the use of experimental plutonium fuel (mixed oxide, MOX) made from weapons-grade plutonium surplus to the nuclear weapons program.

The costly and problem-plagued concept to use MOX in conventional light-water reactors is under pressure and has just faced an additional budget cut by the US House of Representatives. A proposal to use MOX in an SMR is an indication that DOE itself is concerned if it can carry out the MOX program as now conceived, according to ANA.

Tritium for nuclear weapons is currently produced by the Watts Bar unit 1 reactor owned by the Tennessee Valley Authority. According to ANA, this shows that the U.S. has quietly crossed the imaginary line between the military and civilian nuclear processes and is engaged in a project which undermines sound nuclear non-proliferation policies. "For non-proliferation, safety and cost reason, production of tritium and use of MOX fuel should be ruled out for any SMRs," said Clements.

SRS is engaged in an intensive promotional campaign to secure SMRs at the site in spite of the fact that they only exist on paper, no design is licensed by the Nuclear Regulatory Commission and sources of funding for development and construction of the reactors have not been identified. This effort by SRS to present itself as a leading SMR candidate site is in parallel with the overly enthusiastic media campaign by SMR vendors to promote their specific models, according to ANA.

"While SRS may superficially appear to present certain attractive aspects for the location of SMRs, the site has not had experience with operation of nuclear reactors in over twenty years and has no current expertise in reactor operation," said Clements. "While DOE is set to chose two SMR designs to fund for further development, SRS affirms that no construction funds will be provided, leaving vendors with the difficult and perhaps insurmountable task to find private funding for SMR construction."

Two of the three separate "Memoranda of Agreement" for three different and still hypothetical SMR designs include deployment timelines which are already admitted by DOE to be inaccurate since they were signed less than six months ago.

As SMRs are being promoted for overseas markets, SRS officials will not say what plans are for used reactor vessels or highly radioactive spent fuel which would be taken back to the production site. "If SRS would become a nuclear waste dumping site due to involvement in SMR programs, this is something that the public in South Carolina will soundly reject," said Clements.

###

Notes:

The three MOAs obtained by ANA include agreements with SRS and the following vendors:

SMR, LLC (http://holtecpower.com/) – signed December 2011
http://www.ananuclear.org/Portals/0/SMR,%20LLC%20MOA.pdf

NuScale (http://www.nuscale.com/) – signed March 2012 (unredacted version has now been obtained – available on request)
http://www.ananuclear.org/Portals/0/NuScale%20MOA.pdf

Hyperion Power Generation (now Gen4 Energy, http://www.gen4energy.com/) – signed December 2011
http://www.ananuclear.org/Portals/0/Hyperion%20MOA%20.pdf

MEMORANDUM OF AGREEMENT

BETWEEN

SMR, LLC,

AND

DEPARTMENT OF ENERGY – SAVANNAH RIVER,

AND

SAVANNAH RIVER NATIONAL LABORATORY

Introduction

This Memorandum of Agreement (MOA) is entered into by and between SMR, LLC (SMR) a wholly owned subsidiary of Holtec International, the Department of Energy – Savannah River (DOE-SR), and the Savannah River National Laboratory (SRNL).

SMR, DOE-SR, and SRNL may individually be referred to as a "Party" or collectively as the "Parties".

SMR is developing the HISMUR (Holtec Inherently Safe Modular Underground Reactor) which is a light water, passively cooled, small modular nuclear reactor designed to operate using standard commercial nuclear fuel. The HISMUR has a nominal output of 140 megawatts electric.

Purpose

Whereas: DOE-SR is the landlord of the Savannah River Site (SRS) which includes the Savannah River National Laboratory (SRNL), and

Whereas: SRNL is the applied research and development laboratory for the Department of Energy's Office of Environmental Management (DOE-EM). SRNL is managed by Savannah River Nuclear Solutions (SRNS), the management and operating contractor for DOE-SR, and

Whereas: SMR is a private company formed to develop and market an innovative small modular nuclear reactor concept commonly referred to as the "HISMUR".

By signing this agreement, all Parties agree to the following:

- The Parties agree to collaborate toward the development and execution of a project in which a HISMUR prototype may be constructed, tested, certified, licensed, and operated at the SRS for one or more purposes, including but not limited to:
    - Validating key HISMUR design and safety features through a rigorous program of test and evaluation of the reactor module without electricity production;
    - Producing process heat and/or generating electricity for use by SRS, other federal installations, and industrial/residential energy consumers in the region;
    - Other uses for the HISMUR in support of the DOE-SR, National Nuclear Security Administration (NNSA), and/or SRNL initiatives that could be added to this MOA.
- The business model for the project will be addressed in future agreements.

- The parties anticipate the project being regulated by the U.S. Nuclear Regulatory Commission (NRC).
- Each Party shall identify a point of contact (POC) that is responsible for executing their party's scope within this MOA.
- The Parties may create additional Agreements if needed to develop, license, construct, start-up and test and operate the HISMUR project at SRS.

Scope

Under this MOA, the Parties shall develop Agreement(s) to advance the HISMUR project at SRS including, but not limited to:

- Non-Disclosure Agreement
  - Target Date: January 31, 2012
- Land Use Agreement (LUA)
  - Target Date: March 31, 2012
- Land Lease or Permit Agreement
  - Target Date: December 31, 2012
- Framework for a Power Purchase Agreement(s) (PPA)
  - Target Date: December 31, 2012
- Site Services Agreement (SSA)
  - Target Date: June 30, 2013
- Technical Assistance Agreement (TAA)
  - Target Date: June 30, 2013

In addition, the Parties agree to invite the NNSA to discuss the feasibility of additional Agreements to irradiate Tritium Producing Burnable Absorption Rods (TPBARs) and Mixed Oxide Fuel (MOX).

Terms

1. This MOA will be effective upon the date the last Party signs and remains in effect for three years or until it is replaced or superseded. DOE-SR or SMR may terminate it upon 90 days written notice to the other Parties.

2. Each Party acknowledges that it is entering into this MOA in a spirit of cooperation. The Parties intend to pursue the goals and purposes of this MOA in good faith.

3. The Parties agree that any work to be undertaken pursuant to this MOA will be the subject of separate and specific agreements.

4. The Parties acknowledge that during the course of this MOA they may wish to exchange information of a proprietary nature. The Parties agree that any such exchange

of proprietary information shall be made under a separately written Non-Disclosure Agreement specific to the subject matter being discussed. The Parties agree that proprietary information exchanged under this MOA shall be restricted to individuals assigned to work on the project. The Parties further agree that any proprietary information subject to a Non-Disclosure Agreement provided by SMR to DOE-SR and/or SRNL shall be protected from disclosure to employees and agents of SRNS parent companies and their affiliates.

5. Under this MOA, funding for work is not committed by SMR or DOE-SR. Any commitment of work or funds shall be made under a separate Agreement following the contracting requirements of the Parties.

6. Each Party shall bear all costs, risks and liabilities, which it may incur out of its obligations and efforts under this MOA.

7. Financial and ownership arrangements for publications in the scientific or engineering literature or for any patents that may arise from work performed pursuant to this MOA, will be addressed in separate task agreements consistent with the terms of this MOA.

8. Unless otherwise specified, this MOA embodies the entire understanding between the Parties and any prior representation or agreement is superseded. Any modifications to this MOA must be in writing and signed by all Parties.

9. The Parties agree to adhere to all applicable U.S. export laws and regulations. Each Party acknowledges that it is responsible for its own compliance with all U.S. export control laws and regulations.

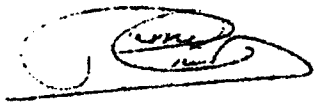
10. Any news releases, public announcements, advertisements or publicity to be released by any Party concerning this MOA, or any proposal or agreement resulting from this MOA, shall be subject to prior approval by the other Parties.

11. The U. S. Department of Energy logo (see attached) shall not be used by the Parties on any promotional material, but the Enterprise SRS logo, the SRNL logo, the SRNS logo, and the SMR logo (see attached) may be used related to the HISMUR project at SRS and shall be subject to the Parties approval.

Authorized Signatures

Those individuals whose signatures appear below certify that they are authorized to sign on behalf of the respective Parties to this Agreement. This Agreement will be executed in triplicate, and is not effective until signed by all Parties.

SMR, LLC
Pierre Oneid
President



Date December 12, 2011

SAVANNAH RIVER NATIONAL LABORATORY
John Temple
Director, Contracts, Savannah River Nuclear Solutions, LLC

John W Temple

Date 12/13/2011

DEPARTMENT OF ENERGY – SAVANNAH RIVER
David C. Moody
Manager, Savannah River Operations Office

David C. Moody

Date 12/19/11

C V S C
Conservation Voters of South Carolina

October 18, 2011

To members of the Blue Ribbon Commission:

South Carolina has a long history of contributing to our national security and making sacrifices for our country. Central to this legacy has been Savannah River Site and we are grateful for the contributions of SRS – and the people who work there – to our national defense.

However, South Carolina has also shouldered a disproportionate share of our country's nuclear waste. This sacrifice has come at a high cost for the social and economic wellbeing of our people. As the Department of Energy itself has stated, the 36 million gallons of high-level nuclear waste at SRS constitute South Carolina's gravest environmental threat.

As the Blue Ribbon Commission deliberates on where to move the high-level spent fuel accumulating at nuclear plants, please consider that South Carolina's conservation community has grave concerns about any proposals that would bring more nuclear waste to our state. **The 17 organizations listed at the end of this letter would like to state for the record that we oppose importing waste under any conditions, including under the pretext of centralized "interim" storage and/or reprocessing proposals. Rather, we support storage of the waste at the site of the reactors in the more robust dry cask storage method, Hardened On Site Storage (HOSS), where it can safely remain until the permanent geologic repositories are ready.**

Having waste in multiple states in multiple congressional districts diminishes the possibility of the one location "out of sight, out of mind" syndrome that is likely if the waste is only in one or two states, whose political status may make it the victim of Department of Energy mismanagement, broken deals or funding issues. And raiding the Nuclear Waste Fund to create centralized interim storage may not leave enough money to locate and build permanent geologic repositories, which take many years, and billions of dollars.

Our state's experience with nuclear waste at the Barnwell low-level storage facility nearby provides an instructive lesson in the pitfalls of importing nuclear waste to South Carolina. After nearly two decades of negotiations, South Carolina finally began closing the door in 2000 as our nation's low-level nuclear waste repository. The Atlantic Compact of 2000 finally recognized that all states have a responsibility in dealing with the dangerous wastes associated with nuclear energy. At the heart of this struggle was the recognition that other states would only move forward with their own storage plans once it was clear that our state would no longer shoulder the nation's burden. In the years since, South Carolinians have only solidified their opposition to bringing nuclear waste to our state, as shown in 2007 when the Legislature firmly rejected efforts to break the Atlantic Compact.

PO Box 50632, Columbia, SC 29250 * 701 Whaley St., Suite 207 * 803-799-0716 * (fax) 803-799-0719 * info@conservationvotersofsc.org

Our country stands at a nuclear waste crossroads. Leaving aside the environmental and scientific suitability or unsuitability of Yucca Mountain, both its selection and its apparent failure were essentially political in nature. Rather than pointing fingers over Yucca's demise, elected leaders at every level need to return to the table and hold an intellectually honest discussion to find a solution to our nuclear waste challenge. The recommendation of centralized "interim" storage only substitutes a long-term national solution with a short-term South Carolina problem. South Carolina has shouldered more than its fair share of the country's nuclear waste burden, and HOSS is the most logical short-term answer, while the decision-making process continues to reach a long term solution, determined by policy, not politics, and by science, not special interests.

Ann Timberlake
Executive Director
Conservation Voters of South Carolina

Audubon South Carolina

Catawba Riverkeeper

Coastal Conservation League

Kitchen Table Climate Study Group

League of Women Voters of South Carolina

Santee Riverkeeper Alliance

Solar Business Alliance

South Carolina Environmental Law Project

South Carolina Native Plant Society

South Carolina Sierra Club

South Carolina Wildlife Federation

Southern Alliance for Clean Energy

Southern Environmental Law Center

Sustainable Midlands

Upstate Forever

United States Department of Energy

Office of Public Affairs

Washington, D.C. 20585

NEWS MEDIA CONTACT:
(202) 586-4940

For Immediate Release
March 22, 2012

Obama Administration Announces $450 Million to Design and Commercialize U.S. Small Modular Nuclear Reactors

COLUMBUS, Ohio – Today, as President Obama went to Ohio State University to discuss the all-out, all-of-the-above strategy for American energy, the White House announced new funding to advance the development of American-made small modular reactors (SMRs), an important element of the President's energy strategy. A total of $450 million will be made available to support first-of-its-kind engineering, design certification and licensing for up to two SMR designs over five years, subject to congressional appropriations. Manufacturing these reactors domestically will offer the United States important export opportunities and will advance our competitive edge in the global clean energy race. Small modular reactors, which are approximately one-third the size of current nuclear plants, have compact, scalable designs that are expected to offer a host of safety, construction and economic benefits.

"The Obama Administration and the Energy Department are committed to an all-of-the-above energy strategy that develops every source of American energy, including nuclear power, and strengthens our competitive edge in the global clean energy race," said Energy Secretary Steven Chu. "Through the funding for small modular nuclear reactors announced today, the Energy Department and private industry are working to position America as the leader in advanced nuclear energy technology and manufacturing."

Through cost-share agreements with private industry, the Department will solicit proposals for promising SMR projects that have the potential to be licensed by the Nuclear Regulatory Commission and achieve commercial operation by 2022. These cost-share agreements will span a five-year period and, subject to congressional appropriations, will provide a total investment of approximately $900 million, with at least 50 percent provided by private industry.

SMRs can be made in factories and transported to sites where they would be ready to "plug and play" upon arrival, reducing both capital costs and construction times. The smaller size also makes SMRs ideal for small electric grids and for locations that cannot support large reactors, offering utilities the flexibility to scale production as demand changes.

Today's announcement builds on the Obama Administration's efforts to help jumpstart America's nuclear energy industry that include:

- In 2010, the Department signed a conditional commitment for $8 billion in loan guarantees to

support the Vogtle project, where the Southern Company and Georgia Power are building two new nuclear reactors, helping to create new jobs and export opportunities for American workers and businesses.

- The Energy Department has also supported the Vogtle project and the development of the next generation of nuclear reactors by providing more than $200 million through a cost-share agreement to support the licensing reviews for Westinghouse's AP1000 reactor design certification. The Vogtle license is the first for new nuclear power plant construction in more than three decades.
- Promoting a sustainable nuclear industry in the U.S. also requires cultivating the next generation of scientists and engineers. Over the past three years, the Department has invested $170 million in research grants at more than 70 universities, supporting R&D into a full spectrum of technologies, from advanced reactor concepts to enhanced safety design.

The full Funding Opportunity Announcement issued today is available at Grants.gov (http://www.grants.gov) .

News Media Contact: (202) 586-4940

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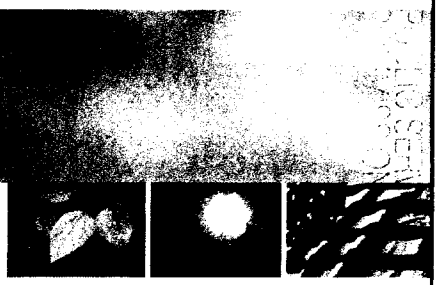
U.S. Department of Energy, Office of Public Affairs, Washington, D.C.

U.S. DEPARTMENT OF ENERGY



Helen Belencan
DOE SR

SRS Citizens Advisory Board
Strategic and Legacy Management Committee Meeting
June 5, 2012

enterprise SRS

Purpose

- **Provide an update on the Small Modular Reactor (SMR) component of the Enterprise•SRS strategic plan**
- **Fulfill Strategic and Legacy Management Committee work plan requirement to provide strategic plan updates**

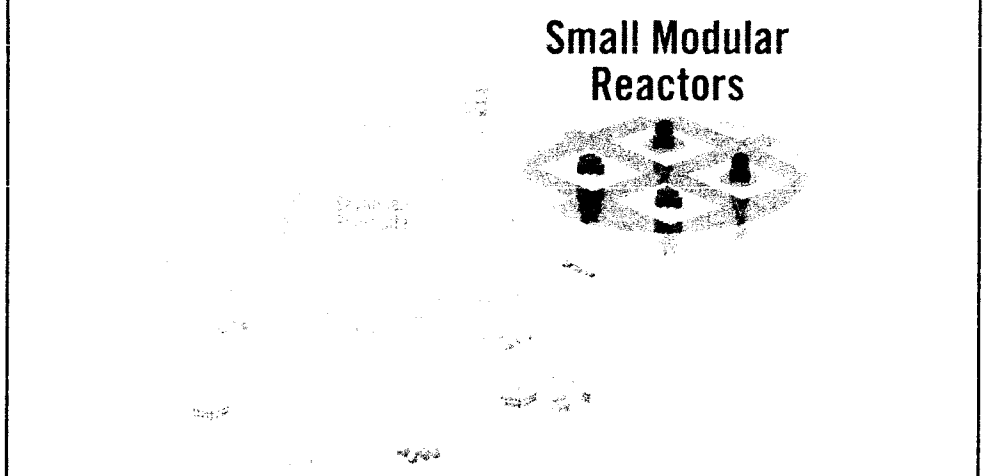
video: on yr tube

What Are Small Modular Reactors?

- Nuclear power plants that are smaller in size (300 megawatts or less) than current generation reactors
- Compact, factory-fabricated and easily transported by truck or rail to a nuclear power site
- Can be grouped together to form a larger nuclear power plant; additional modules can added incrementally as demand for energy increases
- Can operate from two to 10 years without refueling
- Used for electricity generation and industrial process heat applications
- SMRs provide simplicity of design, enhanced safety features, and increased economy, quality and flexibility over conventional nuclear power plants.

U.S. DEPARTMENT OF ENERGY enterprise SRS

SMRs: An Element of the Enterprise SRS Vision

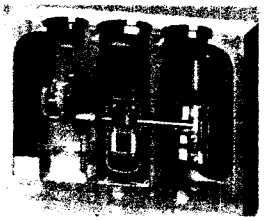


U.S. DEPARTMENT OF ENERGY enterprise SRS

Helen
long time -
the

SMRs at SRS

- **SRS can demonstrate SMR technologies and fuel cycles.**
  - Large buffer area
  - Nuclear pedigree and infrastructure
  - Unique capabilities for fuel fabrication and processing
- **Opportunities and technical approaches for SMRs at SRS**
  - Developing and establishing manufacturing capability for SMR systems and components
  - Demonstrating the safety and reliability of the technology
  - Validate remote fabrication of reactor systems with minimal on-site construction
  - Provide operating experience and performance data
  - Provide clean energy supply for Site power needs
  - Demonstrating economic viability via power purchase agreements with customers



- spent reactor + fuel?

A Canyon operable in 20 years?

Advantages of SRS Deployment

- **Well characterized: 310 square miles**
- **Well-established framework for Federal and state environmental compliance**
  - Many proposed activities may be within established limits for existing programs
- **Cooling water available: two cooling lakes**
- **Transportation: rail system**
- **Utilities: located near north-south power grid**
- **Tested design, construction, project management support**
- **Tested used fuel management research and development through Operations**
- **Best in Class Operations and Safety**

Savannah River Site

- not DOE funded
- market not necessarily in the U.S.; manufacture in US and export

Current Status

- **DOE Office of Nuclear Energy Funding Opportunity Announcement**
  - Issued March 22, 2012
  - Two awards for $226M each ← ?
    - *5 year program*
    - *Cost match with industry*
  - Proposals were due May 21, 2012
    - Proposals submitted by *SMR and NuScale Power*

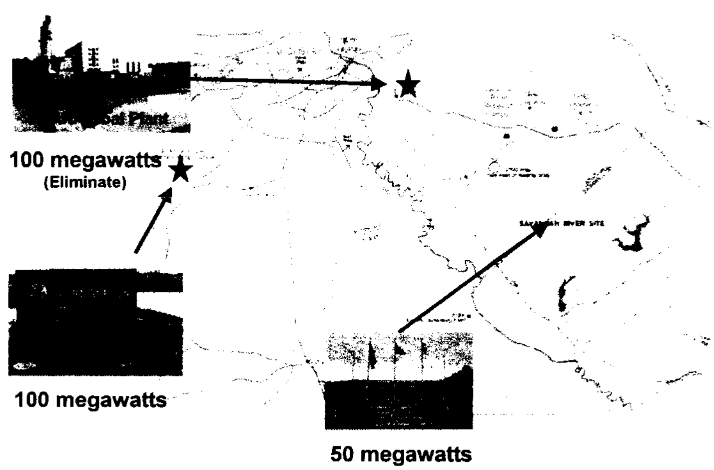
    Identified SRS as the site and SCANA as the operator ←

- **SRS is working with SMR vendors to facilitate their evaluation of SRS as a location for an SMR**

Westinghouse? B&W mPower

U.S. DEPARTMENT OF ENERGY | enterprise srs

Local Electricity Market



convert to natural gas

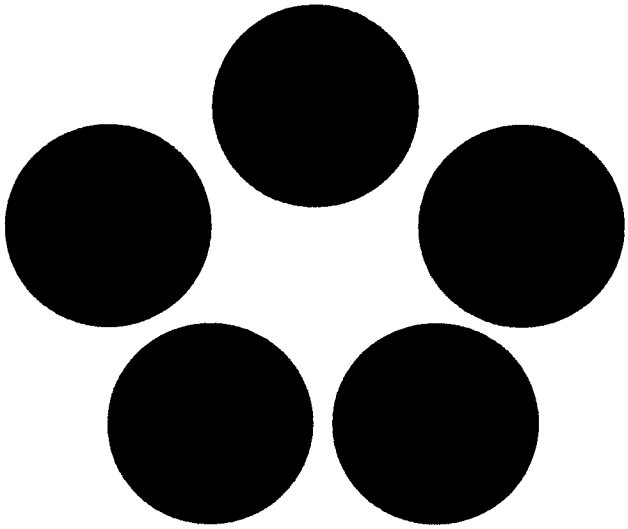
in 20 years?

U.S. DEPARTMENT OF ENERGY | enterprise srs

SCANA looking at SMRs to offset old coal plants

- SMR built by vendor, operated by SCE&G and SRS buys power

Evolving Relationships for SMR Deployment at SRS



U.S. DEPARTMENT OF ENERGY

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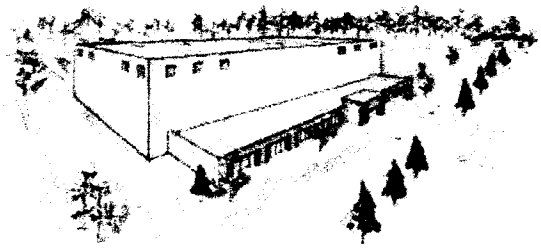
-NRC license

SMR Test and Training Center Vision

- SMR Test and Training Center intended to be a test bed for small modular reactors including simulator
- Small- to full-scale reactor vessels to conduct research/testing to support NRC licensing for commercial applications
- Support educational opportunities for tech schools and universities



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Summary

- SMRs are a way to revitalize SRS assets
- SRS can effectively employ its unique capabilities and provide technical solutions that will advance this technology in the United States
- Opportunities for stakeholder involvement

U.S. DEPARTMENT OF ENERGY

enterprise SRS

Drew Persinko Involved

Rickolson

Print (#)

Charleston Regional Business Journal

http://www.charlestonbusiness.com/news/44251-haley-sce-amp-g-support-smr-industry

Haley, SCE&G support SMR industry

Gov. Nikki Haley said South Carolina wants to do all it can do to show federal officials that the state backs development of the new small modular reactor industry. Holtec, designer of the reactor unit, has applied for one of two $226 million grants from the U.S. Department of Energy.

Staff Report
Published June 19, 2012

Small modular reactors could someday replace South Carolina Electric & Gas' aging fleet of coal-fired power plants, a top utility executive said Tuesday.

A small modular reactor, or SMR, would "fit nicely in that footprint" of a coal-burning plant, said Steve Byrne, COO for Cayce-based SCANA, parent of SCE&G, at a Statehouse news conference.

Instead of putting "very, very expensive" updates on the coal-burning plants, a non-polluting SMR might be a better option, Byrne said. He noted that a coal plant generates about 100 to 150 megawatts — about the same output as an SMR.

Byrne, along with Gov. Nikki Haley, was on hand at the news conference, offering support for the bid of Holtec International (http://www.holtecinternational.com/divisions/smr-llc) — one of the companies seeking to develop SMR technology.

Holtec has applied for one of two $226 million grants from the U.S. Department of Energy for development of an SMR. The federal agency also plans to offer a second grant to another company.

Holtec, designer of the reactor unit, has signed an agreement with NuHub (http://nuhubsc.com/), the commercial nuclear advocacy group in the Midlands, to build a demonstration commercial SMR at the Savannah River Site.

NuScale (http://www.nuscale.com/), a Portland, Ore.-based company, also is partnering with NuHub.

Haley said she wants to generate support for development of the SMR industry in South Carolina because it will bring investment and jobs.

"I want you to think of this just like the Olympics," Haley said. "South Carolina is trying to vie for the Olympics. Every state wants it, every state is going to fight to get it, and every state is going to try to make itself look pretty enough.

"Pretty enough is not good enough. We've got to be aggressive enough," she said.

The state will do whatever it can to support the industry, Haley added.

"We want to do everything we can to show them that the commitment goes both ways. And, we don't only want to do this for South Carolina, but for the country," Haley said.

One DOE grant could lead to the investment of $600 million and some 2,000 jobs, supporters of the SMR project said. Once it's up and running, the SMR industry could generate up to $100 billion a year in revenue, they added.

Holtec CEO Kris Singh said his company has told officials at the DOE that if it fails to get a license to build SMRs it will repay the grant.

"We'll give the money back," Singh said, attempting to damp concerns that the grant might be considered a government handout. "In our case, there's no loss."

Holtec's product is a 160-megawatt pressurized water reactor that has been designed to withstand the most severe natural disasters by relying on gravity under all operating and emergency conditions, Singh said.

"It's the only reactor that's Fukushima proof," he said, referring to the accident that struck a Japanese nuclear plant following an earthquake and tsunami in March 2011.

If Holtec, based in Marlton, N.J., wins the DOE grant, it might be able to make its first reactor by 2018. The demonstration project could have its construction permit by 2014 and a unit could be operational by 2021.

DOE is expected to announce who won the grants some time in August, Singh said.

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